

## REMARKS

### Status of Claims

Claims 1, 4-12, 16-22, 27-30 are pending.

Claims 23-26 have been withdrawn subject to a restriction requirement.

Claims 2-3 and 13-15 have been cancelled.

Claims 1, 7 and 18 have been amended.

Claims 27-30 are new and incorporates the limitation of "dimensional stability" and incorporates all the limitations of amended Claim 1.

No new matter has been added to the application.

### Support for the Amendments

Specifically, in Claim 1, support for the phrase "in contact with the first surface of the polymer membrane" is found in Figure 1 and Figure 2. As indicated in Figure 1, the second temporary substrate that is dimensionally stable (15) is in contact with the first surface of the polymer membrane (12').

Support for the phrase "...polymer membrane having a first surface and an opposite second surface in contact with the second surface of the polymer membrane" is found in Figure 1, and Figure 2 of the specification. Support for the phrase "preformed highly fluorinated polymer membrane" can be in the specification on page 13, lines 29-31 and in Example 1 on page 15. Particularly, in Example 1, it is stated that Nafion membrane is supplied with a coversheet and a polyester backing sheet. Applicants attach a Technical Data Sheet of Nafion® PFSA Membranes (hereinafter referred to as Exhibit A), and Certificate of Quality and Analysis Nafion® PFSA Membranes (hereinafter referred to as Exhibit B) to establish that preformed membranes are well known in the art. Further in Exhibit B it is apparent to person skilled in the art that preformed membrane as supplied is substantially dry as noted by

its low residual solvent content of 0.15 (%w/w).

Support for the phrase "(d) applying a second temporary substrate that is dimensionally stable in contact with the first surface of the polymer membrane to the at least one first electrode formed in step (c)" is found in the specification at page 15, lines 3-8, and in Figure 1, where the lamination at points 17' and 17" of the temporary substrate (15) is illustrated.

Support for the phrase "dimensional change" of first and second electrodes in new Claims 27 - 30, is found in specification at page 18, lines 23-34, and in examples at page 17, lines 8 and 36, and page 18, lines 5-6, where the dimensional change of the electrode area was shown to be less than 3%.

#### **Claim Objections**

In [6] of the Office Action the dependent Claims 2 and 3 were objected. The Examiner states that these Claims fail to further limit the subject matter of Claim 1. Applicants have cancelled Claims 2 and 3, and the objection is believed to be obviated.

#### **Claim Rejections: 35 USC § 112 - first paragraph**

In [8] of the Office Action, Claims 1-12 and 16-22 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Applicants have amended Claim 1. Claims 2-3 and Claims 13-15 have been cancelled. Claims 4-12 and 16-22 depend from Claim 1. New Claims 27-30 depend from Claim 1.

The Examiner states that the two step process a) and b), was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. Specifically, the Examiner notes that the step of printing/applying a first electrocatalyst coating composition on the first surface of the polymer membrane was disclosed in the specification as a one step process and not a two step process.

Claim 1 as currently amended, recites in step a) providing a preformed highly fluorinated polymer membrane in contact with the second surface of the polymer

membrane, and printing a first electrocatalyst coating composition on the first surface of the polymer membrane. Applicants believe that this recitation is in conformance with the disclosure at page 14, lines 18-24, provides a description of the process depicted in Figure 1 as stated below:

As shown in Figures 1, an element **10** comprising a polymer membrane **12**, having a first surface **12'** and a second surface **12"**, and a dimensionally stable substrate **11** is fed past at least one printing station **13**, and drying station **16**. Electrocatalyst coating composition **20** may be applied at the print station **13** onto element **10** and dried to form a first electrode **14** on the surface **12'** of membrane **12** of element **10**.

Accordingly, Applicants request removal of this rejection and allowance of Claims 1, 4-12, 16-22, and 27-30.

In [9] of the Office Action, Claims 1-12 and 16-22 were rejected under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. Claims 2-3 and Claims 13-15 have been cancelled. Claims 4-12 and 16-22 depend from Claim 1. New Claims 27-30 depend from Claim 1.

The Examiner states that the recitation "dimensionally stable temporary substrate adhered to the second surface of the polymer membrane" is not disclosed as "the printing step does not undergo the same step as the adhering step". Also the Examiner points to the specification and reiterates that "the temporary substrate has to adhere to the polymer membrane during the printing step." Further, the Examiner states that there are no requirements that "a first surface of the dimensionally stable temporary substrate to be adhered to the second surface of the polymer".

Amended Claim 1 in step a) recites that a preformed highly fluorinated polymer membrane having a first surface and an opposite second surface with a first temporary substrate that is dimensionally stable which is **in contact with** the second surface of the

polymer membrane, and in step f) that the second surface of the membrane is printed by the second electrocatalyst. Thus the Examiner's contention that "dimensionally stable temporary substrate has to adhere to the second surface of the polymer membrane" is moot in light of the amendment. Further, the contact between the first temporary substrate with the second surface of the membrane is shown in Figure 1, supports the membrane during the printing step. This could be reasonably ascertained by a person skilled in the art by examining Figures 1 and 2 and the specification.

Accordingly, Applicants request removal of this rejection and allowance of Claims 1, 4-12, 16-22, and 27-30.

In [10] of the Office Action, Claims 1-12 and 16-22 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claims 2-4 and Claims 13-15 have been cancelled. Claims 4-12 and 16-22 depend from Claim 1. New Claims 27-30 depend from Claim 1.

The Examiner states that there is no requirement that removing the first dimensionally stable substrate from the second surface of the polymer membrane after step (d), and particularly that step (d) has to be completed before the step (e) occurs.

Referring to Figure 1, Applicants wish to point out that application of the second temporary substrate (15) is performed in step (d) shown at points 17 and 17'; and at a subsequent point along the production line, where the removal first temporary substrate (11) [i.e. step e)] is performed.

Also, in the specification at page 6, lines 23-33, it is stated that:

"After drying to form a first electrode on the membrane, a second dimensionally stable, **temporary substrate is applied to the dried first electrode**. The first dimensionally stable, temporary substrate **is then removed**. [emphasis added]

Accordingly, Applicants request removal of this rejection and allowance of Claims

1, 4-12, 16-22, and 27-30.

In [11] of the Office Action, Claims 1-12 and 16-22 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claims 2-3 and Claims 13-15 have been cancelled. Claims 4-12 and 16-22 depend from Claim 1. New Claims 27-30 depend from Claim 1.

The Examiner states that the specification, while being enabling for "(a) applying at least one electrocatalyst coating composition an element comprising a polymer membrane having a first and second surface, and a first dimensionally stable temporary substrate, wherein the coating composition is applied to at least portions the first surface of the polymer membrane", does not reasonably provide enablement for "a first dimensionally stable temporary substrate adhere to the second surface the polymer membrane". According to the Examiner the specification does not disclose that dimensionally stable temporary substrate is required on both sides of the membrane.

Amended Claim 1 recites that the first dimensionally stable temporary substrate is in contact with the second surface the polymer membrane. See prior discussion on preformed membrane that is supplied with a backing sheet.

As seen from Figure 1, after the application of the second temporary substrate (15) as shown at points 17 and 17', and prior to the removal second temporary substrate (11) [as recited in (i.e. step e)], both sides of the membrane are protected by temporary substrates, that are dimensionally stable.

Accordingly, applicants request removal of this ground of rejection and allowance of Claims 1, 4-12, 16-22, and 27-30.

#### **Claim Rejections: 35 USC § 112– Second paragraph**

In [16] of the Office Action, Claims 1-12 and 16-22 were rejected under 35 U.S.C. 112, second paragraph.

Examiner states that recitation of Claim 1 "dimensionally stable temporary substrate" is unclear.

Claim 1 is amended to recite "temporary stable substrate that is dimensionally stable" for clarification. Claims 2-3 and Claims 13-15 have been cancelled. Claims 16, 4-12 and 16-22 depend from Claim 1. New Claims 27-30 depend from Claim 1.

As pointed out earlier, this term is described adequately, and Applicants request removal of this rejection and allowance of Claims 1, 4-12, 16-22, and 27-30.

In [17] of the Office Action, Claims 2, 3, 7, 8 were rejected under 35 U.S.C. 112, second paragraph.

The Examiner states Claim 1 is narrower than Claim 2, and the term "applying through lamination in Claim 3" can be different from "adhesion".

Claims 2 and 3 have been cancelled. Claim 7 has been amended to depend from Claim 1. Claim 8 depends from Claim 7. Accordingly, Applicants request the removal of this rejection, and allowance of Claims 7 and 8.

In [18] of the Office Action, Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as the Examiner states that the term "or both is" unclear.

Applicants have amended Claim 18 to remove the extraneous term "or both", and removal of this rejection and allowance of Claim 18 is requested.

#### **Claim Rejections: 35 USC § 103(a)**

In [25] of the Office Action, Claims 1-8, 10-12, 16-18, and 20-22 were rejected under 35 U.S.C. 103 over Marsacq et al (WO 01/65623 as evidenced by U.S. Publication Number 2003/0022054) in view of Denton et al. (U.S. Patent No. 5,716,437). Claim 1 has been amended, and Claims 2-3 and 13-15 have been cancelled. Claims 7 and 18; and Claims 27-30 depend from Claim 1.

Applicant's process as recited in amended Claim 1, recites providing a first

temporary substrate on a preformed membranem printing a first electrocatalyst coating composition on the first surface of the polymer membrane, and then applying a second temporary substrate in contact with the first surface of the polymer membrane, and printing a second electrocatalyst on a least a portion of the second surface of the polymer membrane, so that a sandwich is formed which comprises a second electrode, the polymer membrane, the first electrode and the second temporary substrate. It is respectfully submitted that Marsacq fails to disclose this process of using a second temporary substrate, and hence does not form this claimed sandwich. Thus, Marsacq does not disclose or suggest all the limitations of the Applicants amended Claims.

The Examiner cites Denton as a method of printing an electrocatalyst on a membrane and cures the deficiencies of Marsacq. Denton merely discloses that printing of coatings can be performed and there is no absolutely no indication or any predictability that such printing methods would function in Marsacq's process. Accordingly, Applicants contend that neither Marsacq nor Denton and their combination render obvious the claimed process, and request allowance of Claims 1, 4-12, 16-22, and 27-30.

In [26] of the Office Action, Claim 9 was rejected under 35 U.S.C. 103 as being obvious from Marsacq et al as evidenced by Denton et al. and further in view of Lertola (U.S. Publication No. 2005/0255372).

Lertola merely states that flexographic printing can be used. For the reasons stated above, neither Marsacq or Denton disclose or suggest the claimed process, and there is no predictability that flexographic printing can cure their deficiencies. Accordingly, allowance of Claim 9 is requested.

In [27] of the Office Action, Claim 19 was rejected under 35 U.S.C. 103 as being obvious from Marsacq et al in view of Denton et al. and further in view of Sompalli (U.S. Patent No. 6,524,736).

Sompalli discloses a method to remove a substrate off a membrane by peeling. For the reasons stated above, neither Marsacq, Denton or Sompalli disclose or suggest

the claimed process and render obvious Claim 19. Accordingly, allowance of Claim 9 is requested.

**Rejection over O'Brien under USC § 103(c)**

In [30] of the Office Action, Claims 15-9, 17, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien (U.S. Provisional Application 60/349,034 relying upon U.S. Publication Number 2004/0201122 A1 (issued as US Patent 7316794).

Applicant directs the Examiner's attention to the fact that O'Brien is available as a reference only under 35 U.S.C. §102(e), and as such the outstanding rejection is a rejection under 35 U.S.C. §102(e)/103. Applicant respectfully asserts that the rejection is improper under 35 U.S.C. §103(c), since the invention of the present application was owned by the assignee of the O'Brien reference, as of the date of invention hereof.

As evidence of this fact, and pursuant to 37 C.F.R. §1.104(a)(5), Applicant submits a copy of the Assignment of the entire right, title and interest of the inventor, O'Brien (Exhibit C) to DuPont, which was submitted in the present application and was duly recorded at Reel 012917, Frame 0973 on May 21, 2002, as evidenced by a copy of the Notice of Recordation of Assignment, also attached (Exhibit D).

Accordingly, since the present application was owned by the Assignee of O'Brien at the time of hereof, the rejection is improper under 35 U.S.C. §103(c). Withdrawal of the rejection is requested.

**Claim Rejections – Double Patenting**

In [29] of the Office Action, Claims 1,5-9, 17 and 19-22 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 1-15 and 18-20 of copending Application No.10/490,068 (issued as US Patent 7316794). Applicants respectfully request that the requirement of filing a terminal disclaimer, if necessary, to overcome this rejection be held in abeyance until the scope of the allowable claims in the present application is determined.



In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

/Jane O. Hamby/

**JANE O HAMBY**  
ATTORNEY FOR APPLICANTS  
Registration No.: 32,872  
Telephone: (302) 892-7907  
Facsimile: (302) 892-0699

Dated: Jane O. Hamby  
Attachment: Notice of Assignment